

CONSTRUCTION PLANS

TITLE 6

CONSTRUCTION PLANS

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CHAPTER 6-01

GENERAL

Sections:

6-01-010. General

Section 6-01-010. General

Seven sets of plans (four sets if grading plans only), three copies of the engineer design report, and two copies of the drainage report will be required with the first submittal and four sets of the plans and reports for any subsequent submittals for review, for private development projects. Submit all plans and reports to the Engineering Project Manager assigned at the Development Review Board.

At the time of submittal of plans for private development projects, all plan check fees per current adopted fee schedules shall be paid.

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CHAPER 6-02

PLANS

Sections:

6-02-010. Plans Required

Section 6-02-010. Plans Required

Engineering plans are required for construction of any new improvements within existing or proposed public rights-of-way or easements. Plan requirements may be waived by the City Engineer for jobs of a minor nature, such as driveway cuts and sidewalk replacement. Plans shall be prepared by an AZ registered Engineer.

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CHAPTER 6-03

REVIEW

Sections:

6-03-010. Review by City Engineer

Section 6-03-010. Review by City Engineer

Prior to issuance of any public works permit for construction, plans shall be reviewed and approved by the City Engineer or his authorized representative. Such review is intended to assure general compliance with tentative plats, engineering design reports, and all applicable City Codes, Standards, and Regulations. This review is not intended to assure accuracy of all plan details or assume design responsibilities from the designing Engineer. In the event of plan errors or omissions, City standards will take precedence over the plans. Approval of the plan(s) by the City Engineer does not imply that the City is responsible for the correctness or completeness of the plans, or for the cost of corrections to the plans and extra work resulting from changes that may be required during construction. Any difficulties encountered during construction will be settled to the satisfaction of the City Engineer by the developer.

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CHAPTER 6-04

CONTENT

Sections:

6-04-010. Content of Plans

Section 6-04-010. Content of Plans

Plans are to meet the minimum requirements set forth in the following sections and must be based on minimum design criteria listed in the sections dealing with specific items (e.g., grading, streets, etc.).

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CHAPTER 6-05

FORMAT

Sections:

6-05-010. Format

Section 6-05-010. Format

All construction plans (grading, drainage, street, water, and sewer) must be submitted in a clear, neat format, with an uncluttered appearance, which conveys all pertinent information at a 1" = 40' (1:500) scale horizontal (1" = 20' may be required if necessary to meet the appearance of objectives), and 1" = 4', (1:50) vertical, or larger. Overall drawing size shall be 24" x 36" (610 mm x 914 mm) and shall have a left margin of two (2) inches (50 mm) and a margin of one half (1/2) inch [13 mm] on all other sides. An index map to a set of detailed plans in excess of two sheets shall be presented.

The design engineer may request a variance for a particular project, where the above plan format criteria are not appropriate. The City Engineer may grant an exception to the format criteria where, in his opinion, it is appropriate.

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CHAPTER 6-06

DRAFTING STANDARDS

Sections:

6-06-010. Drafting Standards

Section 6-06-010. Drafting Standards

1. Symbols to be used should conform to ADOT Drafting Guidelines or other widely accepted, clearly defined set of standard symbols.
2. Standard Drawings must be referred to by number for inclusion as part of plans and in the quantity section.
3. A minimum lettering size of 0.08 inches (2 mm) shall be used on all plans.
4. Direction of north arrow will be determined by stationing. All stationing will read from left to right. To accomplish this, the project should have increasing stationing from west to east or south to north.
5. Plan originals shall be on a high quality transparent mylar similar or equal to K & E 4 mil. reverse double matte.
6. Stick-on materials, other than Standard Blue-Stake stickers, will not be allowed on plan originals.

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CHAPTER 6-07

COVER SHEET

Sections:

6-07-010. Cover Sheet

Section 6-07-010. Cover Sheet

A separate cover sheet shall be submitted with all plans and shall include the following when applicable:

1. Concept Approval Note (located above the City signature blocks):

"The City approves these plans for concept only. The City shall not be liable for errors or omissions of the design engineer."
2. Vicinity Map (including a north arrow).
3. Project title.
4. Developer and engineering firm names and addresses.
5. Signature block for City Engineer.
6. Signature block for City Public Works Director.
7. Signature block for City Utilities Director.
8. Block for Arizona Department of Environmental Quality approval (file number and date) if applicable.
9. Signature block for the Arizona Department of Transportation including permit number (if applicable).
10. Completed signature blocks for representatives from all utility and cable television companies.
11. Applicable Notes.
12. Index of the sheets.
13. City of Flagstaff project number in the lower right hand corner.

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14. Utility Conflict Note: "Summary of Utility Conflicts": Information to be provided under this note shall include a brief description of conflicts and the sheet number(s) where they appear.

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CHAPTER 6-08

RIGHT-OF-WAY PLANS

Sections:

6-08-010. Right of Way Plans

Section 6-08-010. Right of Way Plans

Right-of-way plans shall be submitted for all construction projects that require right-of-way acquisition. Right-of-way plans shall consist of a title sheet, ownership record sheet, vicinity map, and plan sheets, and may be a part of the construction plans if they were previously approved by the City Engineer. All sheets shall be sealed by a Registered Land Surveyor.

This requirement may be waived if right-of-way dedications are minor or insignificant and previously approved by the City Engineer.

Right-of-way plans are to be used in conjunction with the acquisition and disposal of property and property rights. They shall contain sufficient data to allow them to be used as the primary source for the field location of all public right-of-way and property lines affected by the right-of-way changes shown on the plans. Except as authorized otherwise, they shall be based upon a previously recorded record of survey drawing prepared for the given project.

For those projects where right-of-way plans are not required, the existing right-of-way location and dimensions will still be needed for roadway design, except as authorized otherwise. If material discrepancies exist or there are insufficient survey monuments to determine right-of-way limits, the description of the existing right-of-way shall be based upon a result of survey prepared for the given project and shall be shown on the construction plans.

Right-of-way plans shall show:

1. Right-of-way control/monument line.
2. All existing and proposed right-of-way limit lines.
3. Dimension from monument line to existing and new right-of-way limit line.
4. Monument line stationing with appropriate ties to intersecting property lines and changes in right-of-way width.

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5. Any new or existing easements, either temporary or permanent.
6. For each parcel to be acquired:
 - a. A parcel identification number.
 - b. The property ownership lines.
 - c. The County recorder's numbers for affected parcels including all existing rights-of-way and easements.
 - d. The area in square feet or acres (square meters or hectares) of the part to be taken and of each remainder of a partial taking.
 - e. Bearings and distances around the perimeter of all takings.
7. All intersections of the monument line with an established section line.
 - a. The appropriate stationing shall be shown.
 - b. All section lines shall be shown with bearings and distances to the monument line.
8. Thorough descriptions of all sectional control.
9. Basis of bearing.

The size, form and arrangement of right-of-way plans shall conform to the general requirements for construction plans and should contain sufficient dimensional and angular data to permit ready identification and correlation with the legal descriptions of all parcels.

For all acquisitions, the Ownership Record Sheet shall show the name of owner, brief description of the property to be acquired, and area of each parcel of land affected. It shall be prepared in uniform order with each parcel number being in numerical sequence. The Ownership Record shall contain the following:

1. Parcel Number - a number shall be assigned to each individual parcel affected.
2. County Recording Number - Docket, Page; Book, Map; etc.
3. Description - a brief description of that part of the parcel being affected.
4. Parcel Area - area of the newly created right-of-way or

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easement; area may be shown in acres unless so small that a fractional part of an acre would be deceiving.

5. Remainder - area of the parcel remaining after the right-of-way or easement has been taken from the total parcel.
6. Sheet Number - a number indicating the sheet on which the parcel can be located.

A vicinity map showing the project and its relationship to the surrounding area shall be shown.

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CHAPTER 6-09

CONSTRUCTION

Sections:

6-09-010. Construction Plan Sheets

Section 6-09-010. Construction Plan Sheets

The following information is generally required for each construction plan sheet:

1. North arrow (with North up or to the left or right).
2. Horizontal control points and stationing.
3. Temporary bench marks (T.B.M.'s) and elevations relative to City datum (in NAVD 88). Plans shall also indicate the City bench mark and elevation utilized in establishing the T.B.M.
4. Property lines, easement lines, and right-of-way limits.
5. Street names, lot numbers and subdivision names.
6. Horizontal location of proposed and existing improvements relative to existing and proposed right-of-way, centerline and easements.
7. Stationing along centerline and ties to property lines.
8. The signed seal of the professional engineer.
9. Title and revision block.
10. Legend identifying symbols and abbreviations.
11. All grading limits, including top of slope and toe of slope locations and slope gradients if separate grading plans are not required.
12. Location and gradients of all swales and flow lines if separate grading plans are not required.
13. Typical roadway and drainage cross-sections including cross slopes and right-of-way and easement limits located relative to the proposed improvements.

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14. Basis of bearing, including location and description of monuments used to establish basis of bearing.
15. Blue stake sticker.
16. Resource protection areas.
17. Accurate location of all proposed and existing utilities.
18. Clearly differentiate between public and private improvements.
19. All construction plans shall reference, by City of Flagstaff project name and number, previously completed construction projects on adjacent properties. Additionally, as-built information from the previous plans must be referenced as related to the proposed project including but not limited to: benchmark and basis of bearing, horizontal and vertical utility information, and all relevant roadway improvement information.

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CHAPTER 6-10

QUANTITIES

Sections:

6-10-010. Quantities

Section 6-10-010. Quantities

Each set of plans is to have a breakdown of material quantities estimated for public improvement construction of the job. If private improvement quantities are shown, they must be shown separate from the public improvement quantities. The breakdown must indicate the applicable Standard Drawing number when applicable and be in a form suitable for bidding and ordering. Plan approval by the City Engineer does not extend to material quantities shown on the plans. Additionally, each set of plans is to have the total square footage of impervious surface area of the project site.

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CHAPTER 6-11

AS-BUILT PLANS

Sections:

6-11-010. As-built Plans

Section 6-11-010. As-built Plans

Prior to approval of the public improvement plans, an "as-built" fee shall be paid to the City of Flagstaff. This fee will be based on a rate of 1% of the approved Engineer's estimated cost of the offsite improvements. It will pay the cost for City personnel to locate water mains, sewer mains, and underground drainage structures relative to right-of-way boundaries, lot lines, or other points of survey, locate and reference all sewer and water services, all fittings and valves, and all manholes.

The City will add this information to mylar reproducible construction plans received from the design engineer of the subject project. The as-built reproducible plans will then be placed in City records. However, as-built mylars of the grading and drainage plans, where applicable, are the responsibility of the owner/developer. These must be submitted with the Final Grading Certification and include the information that is required in the City of Flagstaff Stormwater Management Design Manual.

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CHAPTER 6-12

FINAL PLAN SUBMITTAL

Sections:

6-12-010. Final Plan Submittal

Section 6-12-010. Final Plan Submittal

Upon approval of the construction plans, but prior to the issuance of a permit for construction, 2 sets of plan originals (one of which shall be a 4 mil reverse double matte mylar of legible quality) shall be submitted to the City for signatures. One signed original set will be returned to the Consultant for their records. The City will retain one original set as the official plans for the project. The consultant will then provide the City with 7 complete blue-line plan sets prior to the issuance of construction permits. In addition, unless specifically exempted by the City Engineer, the consultant shall provide to the City the approved plans digitally, as required by the City's "Digital Data Submission Standards" (when developed and adopted).

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CHAPTER 6-13

GRADING PLANS

Sections:

- 6-13-010. Plan and Support Information Required
- 6-13-020. Plan Presentation

Section 6-13-010. Plan and Support Information Required

Approval of these plans by the City is for a one-year period, subsequent to the date of approval. If construction work is not started within the one-year period, or has been discontinued for any reason for longer than one year, the plans shall be resubmitted for review and reapproval.

Grading plans shall meet all requirements of Appendix, Chapter 33 of the current Uniform Building Code and the City of Flagstaff Stormwater Management Design Manual. Supporting soils analysis and hydrologic studies may be required. Any excavation or fill exceeding 50 cubic yards (38.3 m³) will require a grading plan and grading permit. When a soils report is required, it shall be referenced on the grading plans by firm, project number, and date.

To ensure coordination between grading and landscaping plans, the following note shall appear on all grading plans:

By signing these plans, the designer of the landscaping plans confirms that these grading plans have been reviewed, is aware of the scope of the project, and has identified and addressed any potential conflicts between the grading and landscaping plans.

Landscape Designer

Date

To ensure coordination between grading and landscaping plans, the following note shall appear on all landscaping plans:

By signing these plans, the designer of the grading plans confirms that these landscaping plans have been reviewed, is aware of the scope of the project, and has identified and addressed any potential conflicts between the grading and landscaping plans.

Engineer/Designer

Date

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Section 6-13-020. Plan Presentation

Two sets of approved grading plans shall be submitted with all grading permit applications. One mylar (4 mil. double matte) of the approved grading and drainage plan(s) shall be submitted as public record prior to issuance of the grading permit.

At a minimum, the grading plan shall be prepared in accordance with the City of Flagstaff Stormwater Design Manual and the latest edition of the Uniform Building Code, Chapter 33.

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CHAPTER 6-14

DRAINAGE PLANS

Sections:

6-14-010. Plans

Section 6-14-010. Plans

Public improvement drainage plans shall be in accordance with the requirements set forth in the City of Flagstaff Stormwater Management Design Manual and Chapter 6-09 of these standards.

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CHAPTER 6-15

WATER AND SEWER PLANS

Sections:

- 6-15-010. A.D.E.Q. Approval
- 6-15-020. Plan Presentation
- 6-15-030. Existing Utilities
- 6-15-040. Sewer Plans
- 6-15-050. Water Plans

Section 6-15-010. A.D.E.Q. Approval

All water and sewer plans must received A.D.E.Q. approval prior to City approval.

Section 6-15-020. Plan Presentation

A bench mark location (temporary bench marks may be acceptable) and elevation is to be established in the field and included on each plan sheet.

Utility main lines and service lines must be located and dimensioned with respect to property lines, easement lines, right-of-way lines and other established points. Stationing must be clear and correlated to profiles and established points of survey. Sufficient elevation information must be shown to allow visualization in three dimensions of utilities, streets, and lots. Typical trench details shall be shown on the plans.

The cover sheet or second sheet with a master utility plan at no smaller than 1"=100' (1:1000) shall be in the final construction plans, showing the limits of each plan sheet, street outlines and locations of all valves, fire hydrants, blow-offs, and manholes.

Section 6-15-030. Existing Utilities

All known existing utilities or other pertinent structures are to be shown on the plans. Where crossings of underground utilities occur, vertical separations need to be shown. If any utility company imposes special conditions or precautions concerning their utility, notation of those instructions shall be included on the plans. Accurate elevation and alignment of all utilities shall be shown on the plans. Potholing shall be utilized in determining utility elevations and alignment if necessary. It is the responsibility of the engineer to locate and determine utility locations.

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Section 6-15-040. Sewer Plans

Sewer plans are to meet criteria of Arizona Department of Environmental Quality (ADEQ) Engineering Bulletin No. 11. Plans and profiles shall be provided which adequately show all manhole stationing, sewer sizes, manhole invert and rim elevations, and length of reach and grades of lines. Stations and dimensions of sewer services are to be shown to each lot. A plan layout of water lines is to be shown on the sewer plan with horizontal distances to water lines shown. Waterline crossings shall be shown in the sewer profile.

Section 6-15-050. Water Plans

Water plans may be presented with sewer plans.

Plans are to show water pipe class and types of materials, sizes, pressure zones, fittings, valves and fire hydrants, and any other special information required for clarity. Elevations or profiles of water lines extending into older unimproved streets may be required if depth of water lines is critical to future or planned development. Waterline profiles shall be included wherever waterline depth is different than the typical standard depth and wherever necessary to clarify clearances to existing or proposed facilities. Water lines of 16" (400 mm) and larger shall be profiled in any case. A plan layout of sewer lines is to be shown on the water plans, with horizontal distances to sewer line shown. A detail showing locations of water meters within rights-of-way or public utility easements is to be included.

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CHAPTER 6-16

STREET PLANS

Sections:

- 6-16-010. Layout
- 6-16-020. Plan Presentation

Section 6-16-010. Layout

Street plans are to conform to the layout of the approved Site Plan, Tentative Plat, a previously recorded plat or to recorded right-of-way documents and easements, and the street design criteria in this document.

Section 6-16-020. Plan Presentation

Plans, profiles, and typical cross-sections are required which contain the following minimum information:

Plans:

1. Street names.
2. Lateral dimensions of streets and rights-of-way, including all pertinent survey data and curb return data.
3. Location of existing and proposed utilities and existing streets to be joined.
4. Drainage structures, including cross gutters, culverts, catch basins, or similar items. Distinguish between existing drainage structures and those proposed. Show a positive outlet for all drainage and any effects on the downstream property.
5. Curb, gutter, sidewalks, and asphalt structures.
6. Bench marks used.
7. New traffic control devices, all existing traffic control devices within the area of the project, and changes in traffic control devices in the vicinity of the project which are required as a result of the project.
8. The top and toe of slope for both cuts and fills.

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9. All curve data shown on the plans shall show a delta, radius, length of arc, and tangent.
10. Survey monument installation shall be indicated on the plans. Appropriate places are street intersections, P.C.'s, P.I.'s, P.T.'s, section corners, sixteenth corners, and subdivision corners if applicable in the streets. Please note Title 11 or survey monuments.
11. Additional information needed to clarify plans or deal with specific conditions.
12. Shall meet requirements of Chapter 6-13 if separate grading plans are not included.
13. Blue Stake sticker on all sheets.
14. Resource protection areas.
15. Flagstaff Urban Trails System.
16. Erosion protection measures for roadway slopes (cut and fill).
17. All areas disturbed by grading shall be seeded per Title 17 of these standards.

Profiles:

1. Bench marks, including description of location and elevation. Source of vertical datum shall be a City accepted benchmark (in NAVD 88). This source benchmark shall be noted on plans.
2. Existing and finished grade profiles. Triple profiles of centerline and both sides of top of curb or edge of pavement if no curb is proposed are required. The presentation must clearly show and distinguish existing profiles and other profile information.
3. Finished elevations, including PVC, PI, and PVT of vertical curves, intersection points, and all other points needed for good vertical control of construction.
4. Slopes and vertical curve lengths.
5. Curb return profiles at intersections.
6. Drainage structures and utilities crossed.
7. Extension of profile a minimum of 200 feet (60m) past the end of the improvement project or as required by the City Engineer

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to insure that design is compatible with future extension.

8. Consistent stationing throughout the plans.
9. Additional information needed to clarify profiles or deal with special conditions, e.g., profile of drainage channels, stationing and elevations at beginning and end of all curb returns, grade breaks, and beginning and end of construction.

Cross-Sections:

1. Typical cross-sections. A typical cross-section is needed for each condition encountered and should be clearly identified as to where it is applicable.
2. Materials and thickness, including select material, aggregate base, prime coat, asphaltic concrete, chip seal coat, curb and gutter, and sidewalk, with notation of the engineering firm preparing the soils report and that report number. The specification and type of material shall be stated. Under-drains may be required if deemed necessary.
3. Horizontal dimensions to all key points.
4. Cross slopes (maximum and minimum if cross slope varies).
5. Parkway conditions. Maximum and minimum slopes are to be shown for cuts, fills, and side hill conditions. Any side ditches or other special conditions are to be shown.
6. Shall show right-of-way widths, relation to centerline, and shall identify by name, the street to which it is applicable.
7. Identify limits of applicability by station if necessary.
8. Shall show typical location of traffic signals, signs, street lights, fire hydrants, etc.

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CHAPTER 6-17

GENERAL NOTES

Sections:

- 6-17-010. General Notes
- 6-17-020. Water and Sewer Notes (water and sewer plans)
- 6-17-030. Paving Notes (Paving Plans)

Section 6-17-010. General Notes

The following notes are to appear on applicable plans:

1. Approval of these plans by the City Engineer is for a one-year period, subsequent to the date of approval. If construction work is not started within the one-year period, or has been discontinued for any reason for longer than one year, the plans shall be resubmitted for review and re-approval.
2. Plan review by the City does not extend to material quantities shown on the plans.
3. A public works permit, issued by the City, is required for all work in City rights-of-way or easements and for construction of any improvements intended to become public property.
4. The City shall be notified 24 hours prior to beginning different phases of construction so that City inspectors may be scheduled.
5. All materials and workmanship shall comply with the current City of Flagstaff "Engineering Design and Construction Standards and Specifications", the current "MAG Uniform Standard Specifications and Details for Public Works Construction", the City of Flagstaff Stormwater Design Manual, and with generally accepted engineering design and construction practice. All work and materials which do not conform to the standards and specifications are subject to removal and replacement at the contractor's expense.
6. Any work performed without the knowledge and approval of the City Engineer or his authorized representative is subject to removal and replacement at the contractor's expense.
7. The City Engineer or his authorized representative may suspend the work by written notice when, in his judgement, progress is unsatisfactory, work being done is unauthorized or defective,

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weather conditions are unsuitable, or there is danger to the public health or safety.

8. The City Engineer may order any or all materials used in the work to be tested according to the American Association of State Highway and Transportation Officials (AASHTO) and the American Society for Testing and Materials (ASTM) Standards. The Contractor shall, at his expense, supply all samples required for testing.
9. Access which meets section 13-04-010, fire hydrants, water mains, and street name signs shall be in place and approved before and at all times during on-site combustible construction and/or prior to issuance of building permits in new subdivisions. Fire Department and Engineering Division approval is required for obstruction of access or water system shutdown.
10. The contractor shall be responsible for maintenance of the streets and of partially completed portions of the work until final acceptance of the work. The contractor shall submit to the City Engineer for approval a construction schedule for any streets required to be closed or partially closed for the construction activity. The contractor shall reopen the streets no later than the opening date shown on the construction schedule or upon order of the City Engineer. The regulation and control of construction traffic shall be as directed by the City Engineer or his authorized representative.
11. Approval of a portion of the work in progress does not guarantee its final acceptance. Testing and evaluation may continue until written final acceptance of a complete workable unit. Any defects which appear in the work within one year from the date of acceptance and which are due to improper workmanship or inferior materials supplied shall be corrected by or at the expense of the owner/developer or the contractor.
12. Acceptance of completed public improvements will not be given until defective or unauthorized work is removed, and final clean-up is complete.
13. Location of underground utilities before work is begun is to be accomplished in accordance with ARS 40-360.22.
14. If work is done on private property in relation to a project constructed under these standards, the contractor will provide the City with written authorization from the property owner to do so.
15. The establishment and use of temporary construction yards shall conform to the current City Land Development Code

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standards for "Temporary Uses".

16. All excavated material shall be disposed of in accordance with applicable City codes and regulations. The contractor shall obtain all required City approvals and permits, as deemed necessary by the City, to dispose of excavated material.
17. All construction staking shall be the responsibility of the contractor/developer and performed under the direct supervision of a Registered Land Surveyor or Civil Engineer.

Section 6-17-020. Water and Sewer Notes (water and sewer plans)

1. Rough grading shall be completed within one-tenth (30 mm) of a foot of plan grade and approved by the City Engineer's authorized representatives prior to installation of underground utilities.
2. No trench shall be filled with bedding material or backfill until the excavation and pipe laying, respectively, have been approved by the City Engineer's authorized representative.
3. A water pressure test is required of all water lines and a hydrostatic or air test is required of all sewer lines and manholes. Tests are to be conducted after backfilling is complete and compacted on all public and/or private underground utilities.
4. Water and sewer service lines are to be marked as shown on the standard service details. No sewer service lines are permitted in a manhole except for dead-end cul-de-sac situations (see Section 9-02-090).
5. Water line disinfection is to be accomplished as outlined in Arizona Department of Environmental Quality (A.D.E.Q.) "Bulletin No. 8."
6. Water pipe classification shall be Class 200 for A.W.W.A. C-900 PVC and Class 350 for ductile iron unless otherwise approved by the City Engineer. C-900 shall conform to cast-iron-equivalent outside diameter and have elastomeric gaskets and couplings. All ductile iron pipe lines shall be polyethylene encased in accordance with MAG Specifications.
7. All materials that come into contact with drinking water shall conform to NSF Standard 61 including gaskets, lubricants, pipe fittings, valves, etc. (NSF-pw seal) (R18-4-119B)
8. All public sanitary sewer lines and private sewer service lines within a public utility easement or right-of-way will be

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inspected prior to acceptance by the City.

9. Water and sewer mains shall be separated in order to protect public water systems from possible contamination. All distances are measured perpendicularly from the outside of the sewer main to the outside of the water main. Separation requirements are as follows:
 - A. A water main shall not be placed:
 - (1) Within six feet (1.83 m), horizontal distance, and less than two feet (610 mm), vertical distance, above the top of a sewer main unless extra protection is provided. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided. Alternate extra protection shall consist of encasing both the water and sewer mains in at least six inches (150 mm) of concrete for at least ten feet (3 m) beyond the area covered by this paragraph.
 - (2) Within two feet (610 mm) horizontally and two feet (610 mm) below the sewer main.
 - B. No water pipe shall pass through or come into contact with any part of a sewer manhole. The minimum horizontal separation between water mains and manholes shall be six feet (1.83 m), measured from the center of the manhole.
 - C. The minimum separation between force mains or pressure sewers and water mains shall be two feet (610 mm) vertically and six feet (1.83 m) horizontally under all conditions. Where a sewer force main crosses above or less than six feet (1.83 m) below a water line, the sewer mains shall be encased in at least six inches (150 mm) of concrete or constructed using mechanical joint ductile iron pipe for ten feet (3 m) on either side of the water main.
 - D. Even when extra protection is utilized, the minimum clearance between water and sewer shall be one foot (1').
 - E. The separation requirements do not apply to building, plumbing, or individual house service connections.
10. When hydrostatic testing is performed, sewer lines shall be tested for infiltration/exfiltration per A.D.E.Q. Engineering Bulletin No. 11. Manholes shall be tested by filling the manhole with water. The applicant shall ensure that the drop in water level does not exceed 0.001 of the total manhole

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volume in one hour.

When air testing is performed, sewer lines shall be tested in accordance with ASTM F 1417-92 (reapproved 1998). Manholes shall be tested in accordance with ASTM Standard C1244-93.

11. Sewer pipe shall be SDR 35, ASTM D3034 of PVC pipe, or Class 350 DIP coal tar epoxy lined, cement mortar lined or HDPE ASTM F894. All ductile iron pipe lines shall be polyethylene encased in accordance with MAG Specifications.
12. No water settling of trench fill material is allowed.
13. All water and sewer design and construction shall conform to the current Arizona Department of Environmental Quality (A.D.E.Q.) requirements. When A.D.E.Q. requirements are in conflict with these standards, the more restrictive shall apply.
14. Tracer wires and tapes shall be installed prior to testing the water or sewer main as required by C.O.F. Standards Section 9-01-020.
15. Water valves shall be adjusted per C.O.F Detail No. 9-03-050 and manholes shall be adjusted per C.O.F Detail No. 9-03-052.

Section 6-17-030. Paving Notes (Paving Plans)

1. Exact point of matching termination and overlay, if necessary, shall be determined in the field by the City Engineer or his authorized representative.
2. No job will be considered complete until: a) all curbs, pavements, sidewalks, catch basins, storm drains, and manholes have been cleaned of all dirt and debris; b) survey monuments are installed and stamped; and c) all frames, covers and valve boxes are adjusted to grade.
3. No paving construction shall be started until all utility lines are completed and approved under proposed paved areas.
4. Base course will not be placed until subgrade has been approved by the City Engineer or his authorized representative.
5. The location of all water valves, fire hydrants, and manholes must at all times during construction be referenced and made accessible to the City.
6. Utility facilities in conflict with this work will be

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relocated by the permittee or the utility owner. This activity shall be coordinated with the owner of the utility to prevent any unnecessary interruption of service to existing customers.

7. Existing street name signs, traffic signs and devices associated with the project shall be maintained during construction and relocated by the contractor as shown on the approved plans.
8. Any changes or additions to pavement markings caused by pavement overlay, chip seal or installation of underground facilities shall be shown on the approved plans.
9. A chip seal is required on all public paving projects. On projects where the contractor causes excessive damage to an existing paved street or there are multiple street cuts (maximum of four in 500 feet [152 meters] an asphalt overlay may be required.
10. A prime coat is not required unless so specified in the soils and pavement report and/or shown on the plans.
11. All curb and gutter, sidewalk, driveways, and sidewalk ramps shall be constructed on a minimum 3 inches (80 mm) of aggregate base course (ABC). The ABC shall be constructed per MAG Section 310, and shall be compacted to 95% relative density.

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CHAPTER 6-18

CONSTRUCTION TRAFFIC CONTROL PLANS

Sections:

- 6-18-10. General
- 6-18-20. Plan Presentation
- 6-18-30. Traffic Control Device Maintenance Requirements

Section 6-18-10. General

Construction traffic control plans shall be in conformance with the requirements of the Federal Highway Administration's Manual of Uniform Traffic Control Devices (MUTCD). All Traffic Control Plans shall be approved by the City's Traffic Engineering Manager prior to issuance of any permits associated with the plans. When a project involves construction that requires a substantial traffic control plan, the plan shall be submitted together with the construction plans to allow for the necessary review time.

6-18-020. Plan Presentation

Construction Traffic Control plans are required for controlling public and construction traffic through work areas and zones as well as for other permitted activities within the public rights-of-way and easements. Traffic Control Plans may reference particular typical drawings contained in Part VI of the MUTCD for work of a minor nature. Traffic Control Plans shall be prepared by persons knowledgeable with the fundamental principles of temporary traffic control and the work activities to be performed.

The Traffic Control Plan shall include but is not limited to the following:

1. Scaled drawings conforming to City Standard Specification No. 6-05-010 of the construction zone, detours, construction stages, and affected surrounding areas. The scale of the drawings shall be 1"=20'(1:200), for construction zones under three hundred feet (300') (90.0 m) in length and 1"=40'(1:500) or 1"=50'(1:500) for construction zones greater than three hundred feet (300') (90.0 m) in length.
2. Project name and address
3. City permit number
4. Plan preparation date
5. Time of day (if applicable) that construction traffic control is to be in place.
6. Traffic control responsibility (name, address, telephone No. and contact person for barricade company)

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7. A listing of all traffic control devices specified for installation
8. The size of the work area (all dimensions)
9. The location of the work area in relation to the cross streets, alleys, or other major reference points (show all distances and dimensions)
10. Show how existing pedestrian and bicycle facilities will be continued through or around the construction zone.
11. Show relocation of transit stops and the continuation of pedestrian access to them.
12. Show how access to existing parking facilities (garages, carports, surface lots, etc.) will be affected
13. Special human resource requirements, such as flaggers (equipment, clothing and flagging methods are required to conform to the MUTCD in every instance)
14. Telephone numbers of persons to be contacted in an emergency and for maintenance of traffic control devices
15. A construction schedule, as well as a schedule of the times of day when work is permitted or when certain lanes are to remain open.

Section 6-18-030. Traffic Control Device Maintenance Requirements

The permittee shall make daily inspections of all permitted traffic control devices. The following elements are the minimum number of items that shall be inspected on a daily basis:

1. Conformance to design
2. Condition of devices
3. Performance of flaggers
4. Placement of devices

In order to improve public comprehension, compliance and safety, city off-site inspectors may approve minor changes to the approved traffic control plan, based on observed field conditions.

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CHAPTER 6-19

FRANCHISE UTILITY PLANS

Sections:

6-19-010. Construction Plans

Section 6-19-010. Construction Plans

For utilities located outside standard locations such as common trenches with City utilities and public utility easements as shown on the approved plans, all franchise utilities, including power, gas, telephone, and cable, shall submit, or cause to be submitted, concept construction plans depicting the utility locations(s), for all City of Flagstaff permitted projects for review and approval prior to start of construction by the Public Improvement Contractor.

Regarding the City of Flagstaff approval, consideration shall include but not be limited to, maintenance concerns, resource and slope protection, street buffer-yards, floodplain concerns, impact to public facilities, utility location, and clear view zones. The City of Flagstaff may require utility relocation as the result of these considerations.